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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,102	04/18/2001	Hideo Nobuhara	13409.3US01	9004

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EXAMINER

BOYD, JENNIFER A

ART UNIT PAPER NUMBER

1771

DATE MAILED: 12/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/837,102

Applicant(s)

NOBUHARA ET AL.

Examiner

Jennifer A Boyd

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,5-10,14-17,19-24,26 and 27 is/are pending in the application.
- 4a) Of the above claim(s) 16 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,3,5-10,14,15,19-24,26 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 9/9/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The Applicant's Amendments and Accompanying Remarks, filed September 30, 2004, have been entered and have been carefully considered. Claims 4, 12, 18, 25 and 28 are canceled, claims 2 and 3 are amended and claims 2 – 3, 5 – 10, 14 – 15, 19 – 24 and 26 – 27 are pending. In view of Applicant's cancellation of claims 18 and 28, the Examiner withdraws the 35 U.S.C. 112, 1st paragraph rejection of claims 18 and 28 as detailed in paragraphs 3 – 4 of the previous Office Action dated March 30, 2004. In view of Applicant's arguments, the Examiner withdraws the previously set forth rejections as detailed in paragraphs 5 – 7 of the Office Action dated March 30, 2004. However, after an updated search, additional prior art has been found which renders the invention as currently claimed unpatentable for reasons herein below.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 2 – 3, 4 – 10, 14 – 15, 19 – 24 and 26 – 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 4 – 6, 8 – 10, 14 – 15, 19 – 20, 22 – 24 and 26 – 27 are rejected as being dependent on rejected independent claims 2 and 3.

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5. Claim 2 requires that the non-woven strip comprises a thermoplastic fiber wherein "said thermoplastic fiber being direction aligned". What is the thermoplastic fiber direction aligned in relation to? Please amend the claim to clarify if only one of the thermoplastic fibers are direction aligned or if all the fibers in the nonwoven fabric are direction aligned in relation to each other. For the purposes of examination at this time, the Examiner will assume that at least one fiber is directionally aligned to the edge of the strip.

6. Claim 3 recites the limitation "the direction aligned non-woven fabric" in the last line of the claim. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

7. Claims 2 - 3, 5 - 10, 14 - 15, 19 - 24 and 26 - 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Terakawa et al. (US 5,753,330) in view of Bird (US 3,802,429) and further in view of Wada (EP 313,920).

Terakawa et al. is directed to a cylindrically shaped product (Title) for use as a filter (Abstract).

As to claims 2 and 3, Terakawa teaches a cylindrically shaped product obtained by binding around a core, a multi-component, conjugate spunbonded long fibers consisting at least two components of a low melting resin component and a high melting resin component and at least two components being hot melt-adhered by the low melting resin component (column 3, lines 1 - 10). Terakawa teaches that the cylindrically shaping machine can be a machine having a winding core around a porous core (column 8, lines 1 - 10).

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As to claims 5 and 19, Terakawa teaches that the cylindrically shaped product is hot-melt adhered by the lower melting resin component (Abstract).

As to claims 7 and 21, Terakawa teaches in Example 1 that the basis weight can be 20 g/m² (column 10, lines 30 – 68).

As to claims 9 and 23, Terakawa teaches that the cylindrically shaped product is contacted with an embossing roll at the time of shaping (column 4, lines 50 – 60).

As to claims 14 – 15 and 26 – 27, Terakawa teaches that the multicomponent, conjugate fibers comprise a low melting resin component and a high melting resin component, having a temperature difference between the two components being 10°C or higher (column 3, lines 1 – 10). Terakawa teaches that the resin for the resin components can be polyamides, polyethylene terephthalate, polybutylene terephthalate, polyester elastomers, polypropylene, polyethylene, and other polyolefins (column 5, lines 60 – 68 and column 6, lines 1 – 5).

As to claims 2 and 3, Terkawa fails to disclose that the spun-bonded material comprises direction aligned fibers.

Bird is directed to a surgical face mask comprising a nonwoven filtration medium (Abstract). Bird teaches that the nonwoven filtration medium is a spunbonded fabric made with continuous length filaments (column 4, lines 60 – 68). Bird teaches that a major portion of the filaments lie in a planes that are substantially parallel to the conveying direction of the moving belt (column 5, lines 5 – 10). Bird teaches that the configuration of the nonwoven results in a maximum utilization of the filaments in the fabric to form fiber free openings in the web and

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these openings are of a sufficiently small size to prevent passage of bacteria through the web (column 5, lines 20 – 25).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to create the spun-bonded strip of Terakawa with direction aligned fibers as suggested by Bird to create a filtration material with high filtration efficiency.

As to claims 2 and 3, Terakawa in view of Bird fails to teach that the strip is arranged in a twill form.

Wada discloses the concept of winding a filter media in a twill form (see FIG. 3) and suggests that such a configuration prevents deformation of the media due to fluid pressure thereby enabling efficient removal of particles (see lines 25-33 of col. 6).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to wrap the nonwoven strip of Terakawa in view of Bird in a twill form as suggested by Wada motivated by the desire to increase the filtration efficiency of the apparatus.

As to claim 2, although Terakawa in view of Bird and Wada does not explicitly teach that the claimed nonwoven strip satisfies the following equation: $(\log_{10} Y) < 3.75 - 0.75 (\log_{10} X)$ where X is the airflow amount and Y is the basis weight, it is reasonable to presume that nonwoven strip satisfies the following equation: $(\log_{10} Y) < 3.75 - 0.75 (\log_{10} X)$ where X is the airflow amount and Y is the basis weight is inherent to Terakawa in view of Bird and Wada. Support for said presumption is found in the use of like materials (i.e. a spun-bonded nonwoven

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wound around a perforated cylinder in a twill pattern) which would result in the claimed property. The burden is upon the Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. In addition, the presently claimed nonwoven which satisfies the following equation: $(\log_{10} Y) < 3.75 - 0.75 (\log_{10} X)$ as required by claim 2 where X is the airflow amount and Y is the basis weight would obviously have been present once the Terakawa in view of Bird and Wada product is provided. Note *In re Best*, 195 USPQ at 433, footnote 4 (CCPA 1977).

As to claims 3, 6 – 10 and 20 – 24, Terakawa in view of Bird and Wada fails to teach that the number of windings of the nonwoven fabric strip from one end to another end in a longitudinal direction of the perforated cylinder is one to 10 per length of 250 mm in the perforated cylinder as required by claim 3, the 2-fold value of the winding number is represented by a fraction having a denominator of two figures or less which is a non-reducible approximate value, the denominator is 4 to 40 as required by claim 3, the strip has a width of 0.5 to 40 cm as required by claims 6 and 20, the product of the width and basis weight is 10 to 200 as required by claims 7 and 21, embossing area rate of 5 to 25% as required by claims 9 and 23, the strip has a thickness of 0.02 to 1.20 mm as required by claims 8 and 22 and the filter has a void rate of 65 – 85% as required by claims 10 and 24. It should be noted that the number of windings, 2-fold value of the winding number, width, basis weight, thickness, embossing rate and void rate are result effective variables. As the number of windings increase and fraction, the filter will more efficiently filtrate mediums containing fine particles. As the width increases, the strip has more coverage area while thinner strip allow more fine tuning in filtration capabilities. As the void rate increases, the filtration properties change. As the area embossing rate increases, the bonding

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strength increases while the filter becomes stiffer. It would have been obvious to one having ordinary skill in the art at the time the invention was create a filter with the number of windings of the nonwoven fabric strip from one end to another end in a longitudinal direction of the perforated cylinder is one to 10 per length of 250 mm in the perforated cylinder as required by claim 3, the 2-fold value of the winding number is represented by a fraction having a denominator of two figures or less which is a non-reducible approximate value, the denominator is 4 to 40 as required by claim 3, the strip has a width of 0.5 to 40 cm as required by claims 6 and 20, the product of the width and basis weight is 10 to 200 as required by claims 7 and 21, embossing area rate of 5 to 25% as required by claims 9 and 23, the strip has a thickness of 0.02 to 1.20 mm as required by claims 8 and 22 and the filter has a void rate of 65 – 85% as required by claims 10 and 24 since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). In the present invention, one would have been motivated to optimize the number of windings, 2-fold value of the winding number, width, basis weight, embossing rate, thickness and void rate to create a properly efficient filter depending on type of particle being filtrated.

Response to Arguments

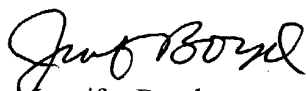
8. Applicant's arguments with respect to claims 2 – 3, 5 – 10, 14 – 17, 19 – 24 and 26 - 27 have been considered but are moot in view of the new ground(s) of rejection.

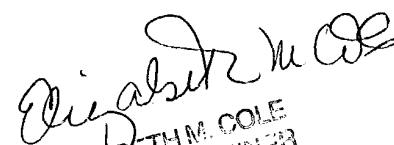
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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer A Boyd whose telephone number is 571-272-1473. The examiner can normally be reached on Monday thru Friday (8:30am - 6:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jennifer Boyd
December 7, 2004


ELIZABETH M. COLE
PRIMARY EXAMINER